UMSOM Global Strategy and Footprint for Fighting Infectious Diseases

E. Albert Reece, MD, PhD, MBA
Vice President for Medical Affairs, University of Maryland
John Z. and Akiko K. Bowers Distinguished Professor and Dean, University of Maryland School of Medicine

November 18, 2014
UM School of Nursing Auditorium
Global Strategy of Academic Medical Centers (AMCs)

• AMCs play a major and critical role in improving worldwide health
  – AMCs conduct a continuum of biomedical research crucial to the pipeline of drug development
  – AMCs study diseases and conditions causing significant burdens to developing countries
  – AMCs train healthcare professionals necessary for improving health and wellbeing globally
Global Strategy of the UM School of Medicine

- UMSOM has established robust programs in biomedical research and clinical care
  - Internationally-renowned experts in virology, infectious and immunological diseases
  - “Big Science” advances have far-reaching implications for diagnostics and therapeutics Nationally & globally

- UMSOM is internationally-focused
  - We want to study and combat diseases, especially in global “hot spots”
  - Long-standing partnerships in developing countries (i.e., CVD, IHV) position us to respond effectively and efficiently to public health threats
Emerging & Re-emerging Infectious Diseases Worldwide

- Chikungunya
- H1N1 Influenza
- Anthrax bioterrorism
- E. coli O157:H7
- Lyme disease
- HIV
- SARS
- E. coli O157:H7
- H5N1 influenza
- Vancomycin-resistant S. aureus
- MERS
- Enterovirus 71
- Rift Valley fever
- HIV
- Ebola haemorrhagic fever
- Marburg haemorrhagic fever
- Yellow fever
- Dengue
- Cholera
- West Nile virus
- Hantavirus pulmonary syndrome
- Whitewater arroyo virus
- Human monkeypox
- Plague
- Human monkeypox
- Nipah virus
- Hendra virus
- MERS

Emerging diseases
Re-emerging diseases

Diseases being studied by UMSOM scientists

Adapted from Nature (2004) 430;242-9
UM School of Medicine Resources & Infrastructure
UMSOM Global Health Research Highlights

**Testing Pandemic Flu Vaccines**

- Influenza pandemics have caused **millions of deaths** worldwide
  - 1918 Spanish flu = 50 M deaths
  - 1956 Asian flu = 2 M deaths
  - 1986 Hong Kong flu = 1 M deaths
  - 2009 Swine flu = >500,000 deaths

- **UMSOM CVD** is at the **forefront** of fighting potential **flu outbreaks**
  - 2009 H1N1 pandemic influenza – CVD tested vaccine to stop “swine flu” outbreak
  - 2011 H5N1 influenza – CVD tested vaccine candidates for “bird flu” to stop possible major spread in people
  - 2013 H7N9 influenza – CVD tested vaccine candidates for new “bird flu”

Karen Kotloff, MD  
James Campbell, MD  
Wilbur Chen, MD
UMSOM Global Health Research Highlights

Seeking Effective Malaria Vaccine

• Malaria is a preventable and treatable disease
  – Endemic to 97 countries, mostly in Sub-Saharan Africa
  – Kills one child (less than 5 yrs. old) every minute

• Scale-up of malaria interventions has saved ~3 M lives
  – CVD Malaria Group at the leading edge of this fight

• Current CVD projects include:
  – Investigating drug-resistant malaria, an ever-growing challenge in the fight against infection
  – Testing new malaria vaccine candidates
  – Understanding malaria infection in specialized populations (e.g., pregnant women)
UMSOM Institute of Human Virology (IHV) combines basic science, epidemiology and clinical research.

IHV investigators working to discover diagnostics and therapeutics for viral and immunologic diseases, especially HIV/AIDS.

IHV has established several research and treatment centers in Africa, S. America & Haiti.

> 500,000 patients under IHV care around the world.

Robert Gallo, MD
UMSOM Global Health Research Highlights

**Other Major Contributions**

- **Development of cholera vaccine**
  - First genetically engineered bacterial vaccine licensed for human use

- **Research into tick-borne diseases**
  - Include some of the most neglected emerging infectious diseases, with high fatality rate, and potential for antibiotic resistance

- **Global Enterics Multi-center Study (GEMS)**
  - One of the most robust studies of diarrheal diseases in the developing world

- **Middle East Respiratory Syndrome Coronavirus (MERS-CoV)**
  - UMSOM conducting research on the virus and testing vaccine candidate

- **Hepatitis C Virus (HCV)**
  - UMSOM conducting studies on epidemiology, immune response and therapy for HCV infections
UMSOM Global Health Research Impact

**Ebola Vaccine Development & Testing**

- CVD leading a consortium conducting trials of new Ebola vaccine in Mali and the U.S.

- UMSOM investigator is co-inventor of one of the antibodies in the Ebola vaccine cocktail

- UMSOM work to fight Ebola has been top media story of the year
  - Audience of 145 million people worldwide
America’s Oldest Public Medical School – Where Discovery Transforms Medicine